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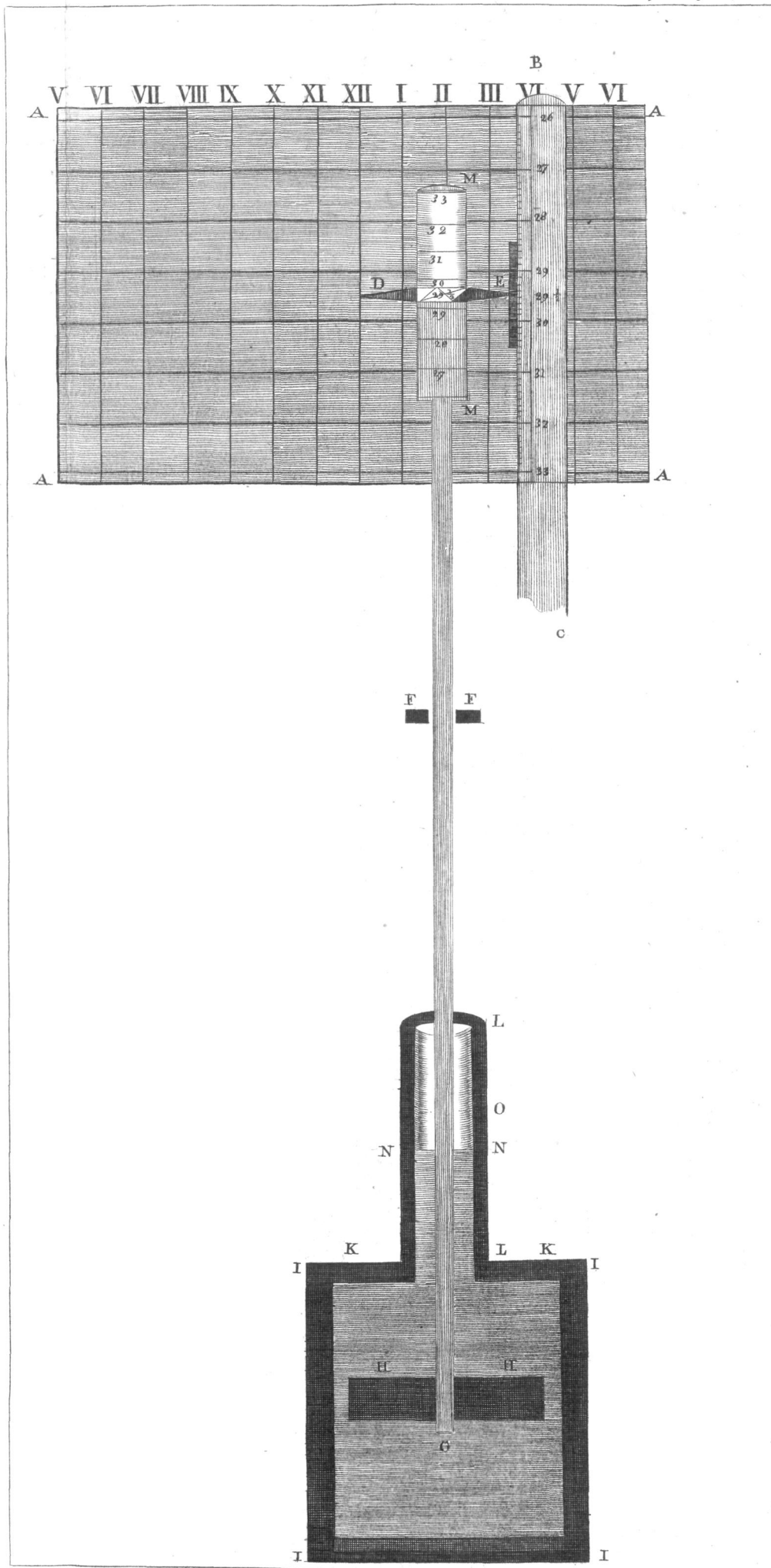
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DESCRIPTION of a SELF-REGISTERING BAROMETER. By
the Rev. ARTHUR M'GWIRE. Communicated by the Rev.
M. YOUNG, D.D. S. F. T. C. D. and M. R. I. A.

AAAA **I**S a piece of paper, upon which are hours and minutes Read May 7,
1791.
 marked by perpendicular lines; and degrees and tenths of
 degrees by horizontal lines. This paper is in a frame, which
 is moved horizontally by clock-work.

BC Is a fixed scale, on which the numbers decrease from *C*
 to *B*.

D Is a pencil which slides into a tube whose center is fixed to
 the cylinder of the barometer at the point where the mercury
 stands when at $29\frac{1}{2}$, to trace the rise and fall of the baro-
 meter.

E Is a vernier, fixed to the cylinder of the barometer at the
 point where the mercury stands when at $29\frac{1}{2}$, to subdivide
 the division upon the scale *B C*.

FF

FF Are two semicircular parts of a tube joined together, to keep the barometer perpendicular.

G The orifice of the tube of the barometer.

HH A circular piece of light wood, cemented to the tube of the barometer, of a size sufficient to make the barometer float at its proper height.

IIII The reservoir for the mercury.

KK A wooden cover, which screws into the reservoir to admit the circular piece of wood *HH*.

LL The tube of the reservoir, which is cemented to the cover *KK*.

MM The cylinder of the barometer.

MG The tube of the barometer.

× Is a mark on the tube of the barometer, which shews the depth at which the barometer floats when the mercury stands at $29\frac{1}{2}$.

THE paper *AAAA* moves horizontally and presses against the pencil *D*. The pencil would trace an horizontal line upon the paper if the mercury remained stationary ; but suppose the mercury descends
in

in the cylinder of the barometer one inch, it will rise in the tube of the reservoir one inch from *N* to *O*; therefore, as there will be a greater quantity of mercury in the tube of the reservoir, the barometer will not remain in its first position, but will float higher by one inch, that is, supposing the cylinder of the barometer and the tube of the reservoir to contain equal quantities in equal distances; but as that part of the barometer which was above the surface of the mercury in the tube of the reservoir when the mercury was at 29¹, is become lighter in proportion as the mercury left the cylinder, so will there be a portion of the tube of the barometer from under the surface of the mercury in the tube of the reservoir, and consequently the barometer will float higher than one inch in proportion to its decrease of weight, and the \times will be above the surface *o*, so that the vernier will have moved more than one inch; therefore the divisions on the scale *BC* will be increased. [When the mercury ascends the contrary will take place.] But as the paper moved horizontally during the time that the mercury descended in the cylinder, and as the pencil *D* marked the paper, the exact height of the mercury will be traced on the paper at every hour and minute.

N. B. THE divisions may be enlarged on the scale *BC* by increasing the diameter of the cylinder of the barometer and lengthening the tube of the reservoir and the reservoir.